## DAHLGREN DIVISION
## NAVAL SURFACE WARFARE CENTER

Dahlgren, Virginia 22448-5100

**NSWCDD/TR-09/57**

# A PREDEPLOYMENT LIMITED TECHNICAL ASSESSMENT OF THE IPOD TOUCH TO AID THE UNITED STATES MARINE CORPS

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**AUGUST 2009**

| REPORT DOCUMENTATION PAGE | | *Form Approved* <br> OMB No. 0704-0188 |
|---|---|---|
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| 1. REPORT DATE *(DD-MM-YYYY)* <br> 14 August 2009 | 2. REPORT TYPE <br> Technical | 3. DATES COVERED *(From - To)* <br> 14 Aug 2009–14 Aug 2010 |
|---|---|---|
| **4. TITLE AND SUBTITLE** <br> A PREDEPLOYMENT LIMITED TECHNICAL ASSESSMENT OF THE IPOD TOUCH TO AID THE UNITED STATES MARINE CORPS | | **5a. CONTRACT NUMBER** |
| | | **5b. GRANT NUMBER** |
| | | **5c. PROGRAM ELEMENT NUMBER** |
| **6. AUTHOR(S)** <br> Peter N. Squire | | **5d. PROJECT NUMBER** |
| | | **5e. TASK NUMBER** |
| | | **5f. WORK UNIT NUMBER** |
| **7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) AND ADDRESS(ES)** <br><br> Naval Surface Warfare Center, Dahlgren Division (Code W60) <br> 5409 1ST Street, Suite 138 <br> Dahlgren, VA 22448-5148 | | **8. PERFORMING ORGANIZATION REPORT NUMBER** <br> NSWCDD/TR-09/57 |
| **9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)** | | **10. SPONSOR/MONITOR'S ACRONYM(S)** |
| | | **11. SPONSOR/MONITOR'S REPORT NUMBER(S)** |

**12. DISTRIBUTION / AVAILABILITY STATEMENT**
Approved for public release; distribution is unlimited.

**13. SUPPLEMENTARY NOTES**
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**14. ABSTRACT**
This document describes the overall Marine Pod project and provides results of a Limited Technical Assessment (LTA). The LTA provided an initial iPod touch usability assessment and identified content and Concept of Operations for a follow-up Extended User Evaluation (EUE). The iPod touch will be provided to members of a deploying Marine Corps unit and assessed during the EUE.

**15. SUBJECT TERMS**
MPod iPod Marines evaluation assessment applications deployment Human Performance

| 16. SECURITY CLASSIFICATION OF: | | | 17. LIMITATION OF ABSTRACT | 18. NUMBER OF PAGES | 19a. NAME OF RESPONSIBLE PERSON Peter Squire |
|---|---|---|---|---|---|
| **a. REPORT** <br> UNCLASSIFIED | **b. ABSTRACT** <br> UNCLASSIFIED | **c. THIS PAGE** <br> UNCLASSIFIED | SAR | 34 | **19b. TELEPHONE NUMBER** *(include area code)* 540-653-8066 |

**Standard Form 298 (Rev. 8-98)**
Prescribed by ANSI Std. Z39.18

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# FOREWORD

The Marine Pod (MPod) project was initiated to determine how a modern, lightweight multimedia device, which can be updated either from on-line resources or from a laptop computer, could assist Marines in carrying out their duties. Its purpose is to provide Marines with user-friendly, handheld portable access to knowledge databases that assist in language translation and familiarization, cultural learning, and Professional Military Education efforts. To evaluate the practicality and utility of such a device, the Marine Corps Warfighting Laboratory, Marine Corps Combat Development Command, Quantico, Virginia, purchased Apple Inc. iPod touches. A Limited Technical Assessment (LTA) was conducted in April and in May 2009 and will be followed by an Extended User Evaluation (EUE).

This document provides the results of the iPod touch LTA. Thirteen active-duty Marines and one retired Marine volunteered for the LTA. They evaluated aspects and applications of the iPod touch as a possible aid for completing their duties. The LTA provided an initial iPod touch usability assessment and identified content and Concept of Operations (CONOPS) for the EUE.

This document also describes the next step in the MPod project, the EUE, which examines the feasibility of deployed Marines using such a multimedia device. The iPod touch will be provided to members of a deploying Marine Corps unit and assessed during the EUE.

Findings from the usability assessment and feedback from the Marines, regarding the CONOPS and content for the MPod project, indicate no significant challenges for the EUE deployment of the iPod touch.

This document has been reviewed by Dennis White, Head, Human Systems Integration Branch; and Robert G. Hill, Head, Sites Planning Engineering and Operations Division.

Approved by:

DONALD L. BURNETT, Head
Warfare Systems Department

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# GLOSSARY

| | |
|---|---|
| CONOPS | Concept of Operations |
| EUE | Extended User Evaluation |
| GUI | Graphical User Interface |
| HPL | Human Performance Laboratory |
| LED | Light-Emitting Diode |
| LTA | Limited Technical Assessment |
| MGRS | Military Grid Reference System |
| MOS | Military Occupational Specialty |
| MPod | Marine Pod |
| NSWCDD | Naval Surface Warfare Center, Dahlgren Division |
| PFT | Physical Fitness Test |
| PME | Professional Military Education |

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## 1.0   INTRODUCTION

The Marine Pod (MPod) project was initiated to determine how a modern, lightweight multimedia device, which can be updated either from on-line resources or from a laptop computer, could assist Marines in carrying out their duties. Its purpose is to provide Marines with user-friendly, handheld portable access to knowledge databases that assist in language translation and familiarization, cultural learning, and Professional Military Education (PME) efforts. To evaluate the practicality and utility of such a device, the Marine Corps Warfighting Laboratory, Marine Corps Combat Development Command, Quantico, Virginia, purchased Apple Inc. iPod touches. A Limited Technical Assessment (LTA) was conducted in April and in May 2009 and will be followed by an Extended User Evaluation (EUE).

This document provides the results of the iPod touch LTA. Several Marines volunteered for the LTA. They evaluated aspects and applications of the iPod touch as a possible aid for completing their duties. The LTA provided an initial iPod touch usability assessment and identified content and Concept of Operations (CONOPS) for the EUE.

This document also describes the next step in the MPod project, the EUE, which examines the feasibility of deployed Marines using such a multimedia device. The iPod touch will be provided to members of a deploying Marine Corps unit and assessed during the EUE.[1]

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## 2.0   LIMITED TECHNICAL ASSESSMENT

The twofold purpose of the LTA was to (1) perform a usability assessment, and (2) obtain user input regarding the content and CONOPS for the MPod. Both items are critical for assessing the capabilities of the MPod and identifying any potential challenges for deployment. A detailed description regarding test objectives and measures is shown in Table 1.

**Table 1. Usability Test Objectives and Measures**

| Usability Test Objectives | Methods and Measures | Results |
|---|---|---|
| 1. Usability Assessment: Evaluate MPod control and display elements | • Hand and fingertip measurements<br>• Attempts and time in task execution<br>• Layout analysis<br>• Elicit feedback via focus group discussion | • Assessment of MPod control and display<br>• Customization of interface elements |
| 2. User Input: Gather user input on MPod CONOPS and content | Elicit feedback via focus group discussion | • Define CONOPS requirements<br>• Identify content |

## 2.1   LTA Sessions

Several LTA sessions were held. Two sessions, with one or two Marines at each session, consisted only of focus groups and were held at Marine Base Quantico, 22 April 2009; and at Naval Surface Warfare Center, Dahlgren Division (NSWCDD), 13 May 2009. The remaining LTA sessions were conducted at the NSWCDD Human Performance Laboratory (HPL), 7 and 14 May 2009.

Thirteen active-duty Marines and one former Marine participated in the LTA. Three Marines participated in the focus group-only LTA sessions, and eleven Marines from Chemical Biological Incident Response Force, based at Indian Head Division, Naval Surface Warfare Center, participated in both the usability assessment and focus group. Table 2 illustrates the demographics of the Marines who participated in the LTA.

**Table 2. Marine Demographics**

| Rank | | | Cpl | Sgt | SSgt | MSgt | 2nd Lt. |
|---|---|---|---|---|---|---|---|
| | | | 6 | 5 | 1 | 1 | 1 |
| Age | | | | 21–24 | 25–30 | 31–35 | 46+ |
| | | | | 8 | 4 | 1 | 1 |
| MOS | Supply | Comms | Networking | Unit Leader | Retired | NA |
| | 1 | 5 | 4 | 1 | 1 | 1 |
| Combat Tours | | | Zero | One | Two | Three |
| | | | 6 | 2 | 5 | 1 |
| PDA use | | | | | Yes | No |
| | | | | | 13 | 1 |
| PDA | | | Blackberry | iPhone | Palm | Other |
| | | | 6 | 3 | 2 | 1 |
| Frequency of PDA use | | | | Monthly | Weekly | Daily |
| | | | | 3 | 4 | 6 |
| PDA Experience | | | | Very little | A good deal | Extensive |
| | | | | 4 | 9 | 1 |

While the LTA focus group-only sessions lasted about an hour, the LTA usability and focus group sessions at NSWCDD lasted approximately 3–4 hours. At both events, the Marines signed an informed consent form that described what was expected of them during the study and outlined their rights as participants. At the NSWCDD events, where a video monitor recorded hand movement, a photographic consent form was also administered. At all LTA sessions, the Marines were invited to provide comments and opinions to any member of the test team at any point during the test event. Once instructions were given, the MOS [Military Occupational Specialty] and demographic and anthropometric data were collected. Anthropometric data was not collected from the focus group-only sessions.

At an LTA usability and focus group session, the Marines were divided into two groups of three or fewer participants. One group participated in the usability assessment, while the second group participated in the focus group. Those who participated in the usability assessment received training on the iPod touch prior to the start of the usability assessment. The training provided the Marines with enough familiarization to perform each required task. After training was completed, the Marines were moved to separate locations in the HPL to perform the usability assessment.

Data were collected through the completion of a predetermined set of tasks listed in Appendix A. Tasks were completed without a protective case on the iPod touch, and one discrete task at a time was performed. Task order was randomized to minimize the effects of learning and fatigue on performance. During each task, test administrators observed and recorded data on the Marines' interaction with their iPod touches. Data collection sheets were used by the test administrators to collect the number of attempts and completion time for each task. When a Marine completed all trials, a questionnaire was administered to obtain feedback on the usability of the iPod touch.

Following the completion of the questionnaire, the iPod touch home screen layout was analyzed to aid in its customization. The Marines examined the home screen and reviewed all the available applications, i.e., calendar, contacts, clock, calculator, notes, settings, FileAid, music, videos, photos. Applications were excluded that require access to the Internet, i.e., stocks, mail, application store, YouTube, the Apple Safari Web browser, maps, weather, and Apple iTunes. Participants then arranged a paper prototype home screen in two sequential steps. First, based on the importance of the application and second, based on expected frequency of use.

While one group performed the usability assessment, a second group participated in a focus group. The focus group provided input about content and CONOPS for the MPod. When both groups were finished, they switched tasks. Once each group participated in both the usability assessment and focus group, the entire group reconvened to debrief. Following the debriefing, the Marines provided feedback regarding the control and display of the iPod touch.

## 2.2 Results

### 2.2.1 *Hand and Fingertip Measurements*

Anthropometric measurements were taken from each Marine. Two different hand measurements were obtained based on DOD-HDBK-743.[2] Hand measurements were taken with the hand held palm up and the fingers extended. Hand length refers to the distance from the base of the hand at the wrist crease to the tip of the middle finger. Marines had a mean hand length of 18.83 cm, within the 5 to 95 percent distribution described in DOD-HDBK-743. Hand breadth refers to the distance across the ends of the metacarpal bones. Marines had a mean hand breadth of 8.68 cm, within the 5 to 95 percent distribution described in DOD-HDBK-743. Hand measurements were positively correlated; thus, a Marine with a longer hand length had a wider hand breadth and vice versa, r = .85, p < .005.

Unlike hand length and breadth, there is no defined anthropometric measurement for fingertips, and a novel measurement for fingertip size was developed. To determine the size of a fingertip, each Marine made a fingertip mark using fingerprinting ink at three different angles— 0, 45, and 90 degrees—for both the thumb and index finger. The major and minor axes of the fingerprint impression were measured, and the surface area for an ellipsoid was calculated: pi*a*b where a = half-length of major axis (horizontal) and b = half-length of minor axis (vertical). As shown in Table 3, this method yields a unique fingertip measurement for each angle.

**Table 3. Index and Thumb Fingerprint Size**

|  | Thumb 0° | Thumb 45° | Thumb 90° | Index 0° | Index 45° | Index 90° |
|---|---|---|---|---|---|---|
| Mean (cm$^2$) | 4.22 | 1.42 | 0.85 | 2.79 | 0.89 | 0.59 |
| SD | 0.61 | 0.44 | 0.19 | 0.67 | 0.14 | 0.09 |

Significant correlations between hand and fingertip measurements were obtained as illustrated in Table 4 and Figures 1 and 2. However, these correlations were only seen with the thumb, and at low angles. For hand length, Marines with a larger hand length had a larger thumb fingertip, or surface area, when it was completely flat (thumb 0°), r = 0.81, p < .005. For hand breadth, two significant correlations were obtained. Marines with a larger hand breadth had a larger thumb fingertip when it was completely flat (thumb 0°) r = .74, p < .015, and when bent at a 45°angle, r = .63, p < .05.

**Table 4. Correlations between Hand and Fingertip Measurements**

|  | Thumb 0° | Thumb 45° | Thumb 90° | Index 0° | Index 45° | Index 90° |
|---|---|---|---|---|---|---|
| Length (cm) | 0.81* | 0.51 | 0.34 | 0.41 | -0.31 | 0.16 |
| Breadth (cm) | 0.74* | 0.63* | 0.31 | 0.46 | 0.02 | 0.11 |

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[2] DOD-HDBK-743A, Military Handbook of 13 Feb 1991, Subj: *Anthropometry of U.S. Military Personnel*

Figure 1 illustrates the hand length (left side) and breadth (right side) by the thumb fingertip surface area at 0, 45, and 90 degrees.
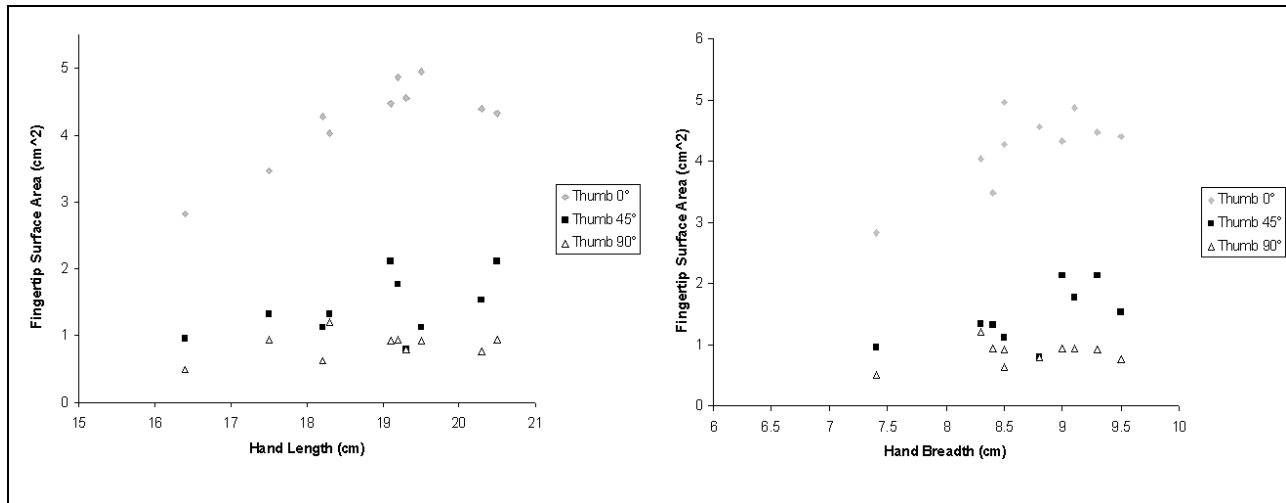


**Figure 1. Hand Length and Breadth by Thumb**

The left side of Figure 2 illustrates hand length, and the right side illustrates hand breadth by the index fingertip surface area at 0, 45, and 90 degrees.
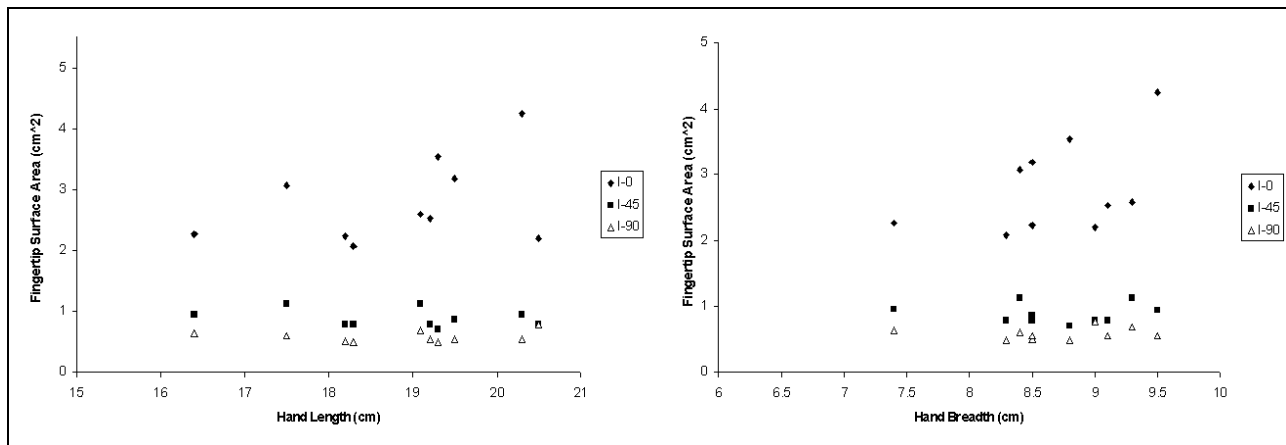


**Figure 2. Hand Length and Breadth by Index Fingertip**

### 2.2.2   Usability Assessment

To assess if there were any difficulties performing the usability assessment tasks, the number of attempts and time data were examined. As shown in Figure 3, results showed that a greater number of attempts increased the total length of time a Marine took to complete the usability assessment session, $r = .72$, $p < .025$.
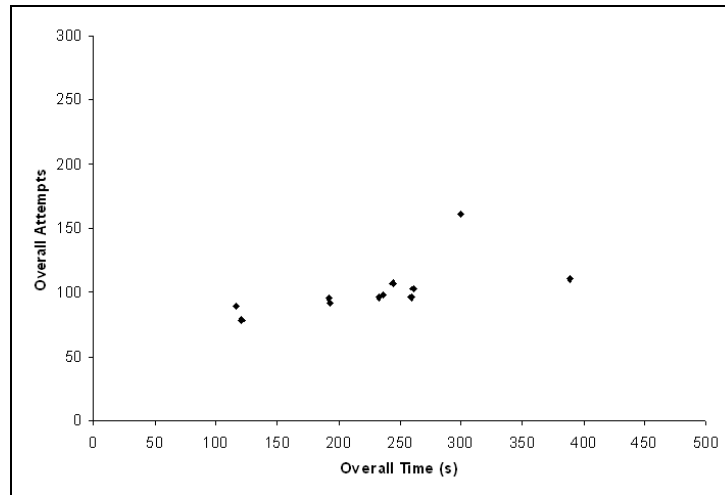
**Figure 3. Positive Correlation between Attempts and Time**

To investigate the influence of tasks on performance, tasks were divided into similar groups for comparisons. Groups were selected based on the method used to operate each task: hardware buttons, Graphical User Interface (GUI) buttons, GUI slider bar, and Adobe Acrobat document manipulation, i.e., Portable Document Format (pdf) files. While multiple attempts were performed with the GUI slider bar before a task was successfully completed, the other task groups were often completed on the first attempt, as shown in Figure 4.
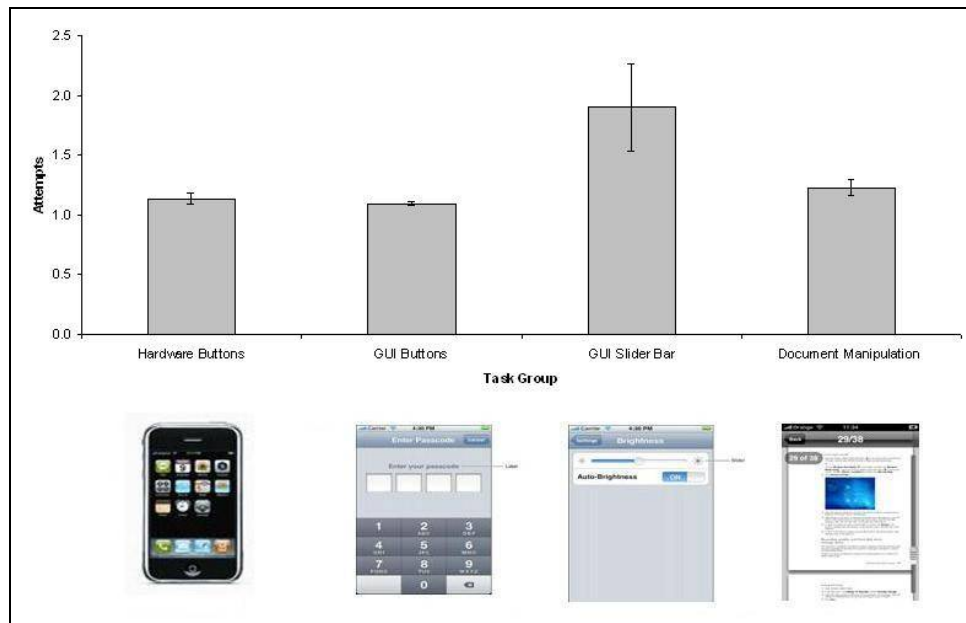


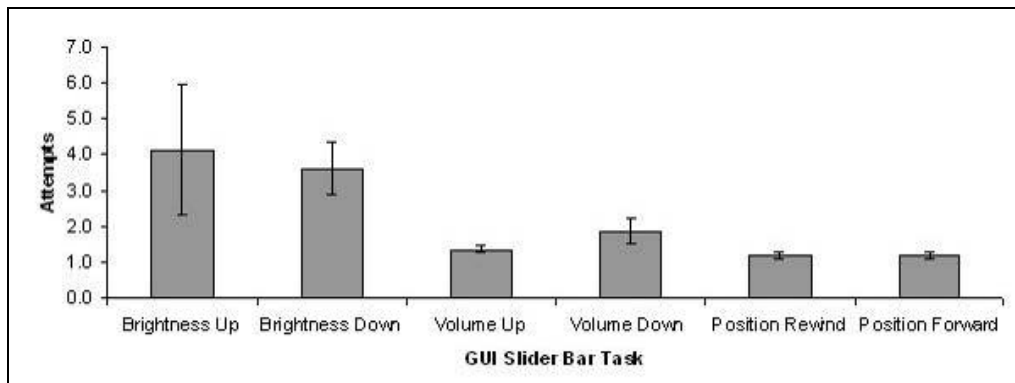**Figure 4. Task Group Mean Attempts and Standard Errors**

Figure 5 shows that the sole exception to this pattern is the GUI slider bar, where several attempts were made. Document manipulation took the longest time to perform; users were required to scroll through multiple pages and find specific text to read.

7
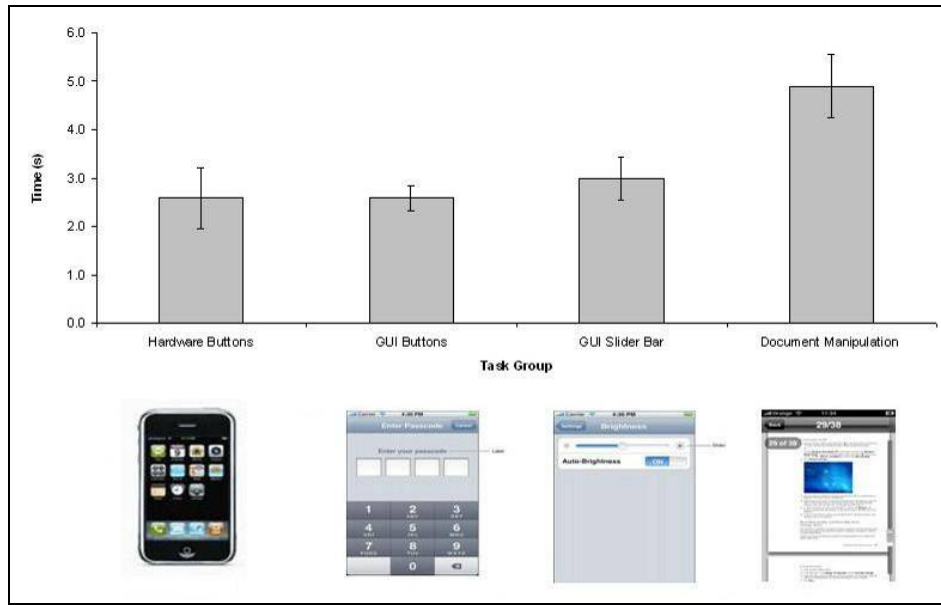
**Figure 5. GUI Slider Bar Mean Time and Standard Errors**

Further inspection suggests, however, that the increase in GUI slider bar attempts was driven by the brightness task only, and not other slider bar tasks as shown in Figure 6.



**Figure 6. Mean Attempts and Standard Errors for GUI Slider Bar Tasks**

The relationship between anthropomorphic measures (hand and fingertip) and performance (accuracy and time) were also examined. While, no significant relationships between hand and performance were obtained; one significant relationship between fingertip size and accuracy was obtained (see Table 4 above). The relationship showed that as the surface area of the index fingertip at 90-degrees increased, accuracy also increased, $r = .72$, $p < .025$. However, as shown in Figure 7, this relationship appears to be driven by a single Marine's performance. If that Marine's data is excluded from the analysis, then the relationship is no longer significant, $r = .17$, $p = .66$.
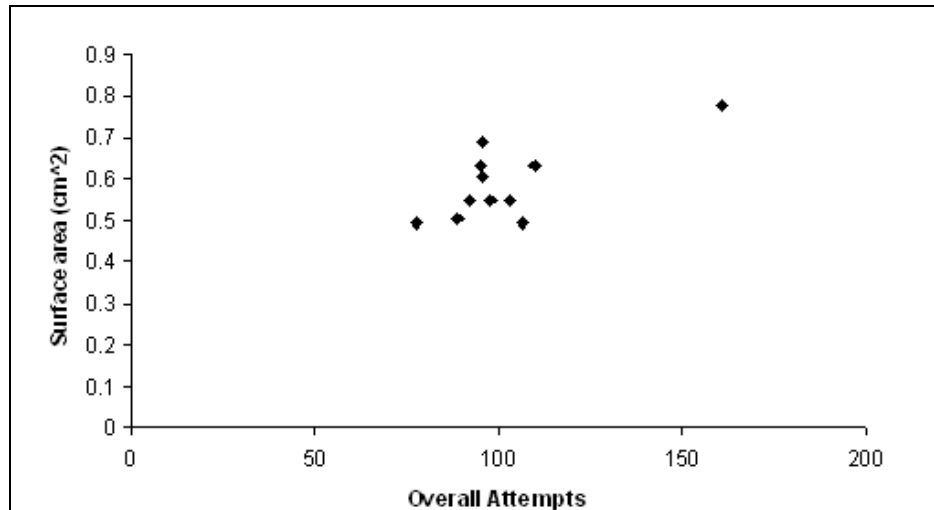
**Figure 7. Relationship between Index Fingertip Measurement and Overall Attempts**

In addition to these tasks, the Marines also performed a note task using the virtual keyboard. As shown in Table 5, no significant relationships between typing time and hand or fingertip measurements were obtained.

**Table 5. Correlation between Typing Time and Hand and Fingertip Measurements**

|  | Length | Breadth | Thumb 0° | Thumb 45° | Thumb 90° | Index 0° | Index 45° | Index 90° |
|---|---|---|---|---|---|---|---|---|
| Time | -0.24 | -0.32 | 0.06 | -0.25 | -0.17 | 0.39 | 0.06 | -0.14 |

### *2.2.3   Questionnaire*

After the usability assessment, the Marines were asked to fill out a questionnaire regarding the iPod touch control and display. The questionnaire included five scale items, based on a Likert-like scaling system, with "5" indicating extremely easy and "1" indicating extremely difficult. As shown in Figure 8, most of the Marines found control and display somewhat easy to manipulate. The only exception to this finding was entering text using the keyboard.
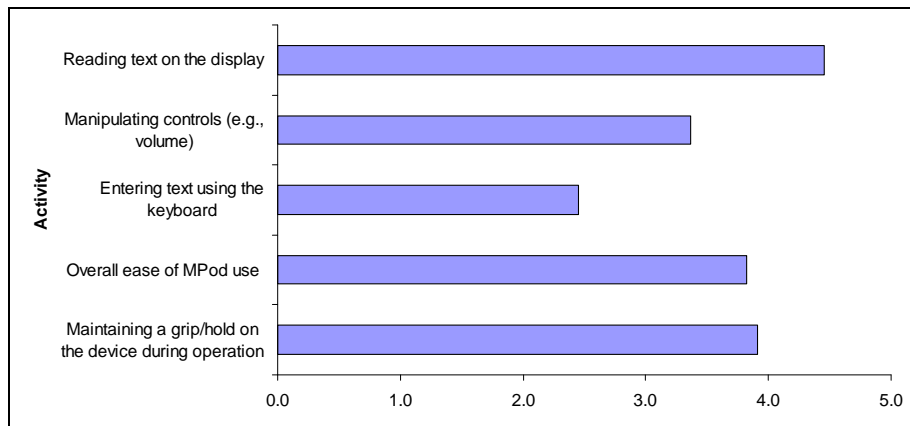


**Figure 8. Questionnaire Results**

The Marines also responded to two open-ended questions:

a. "Did you like the MPod?" One Marine responded no, nine responded yes, and one Marine responded both yes and no, for a total of 2 no and 10 yes responses.
    1. The "no" responses included such comments as:
        a.) Hard to touch keys and controls
        b.) Cosmetically it is superb, but the major drawback is that it is an Apple product.
    2. The "yes" responses included:
        a.) Easy to navigate
        b.) "Ease of use" was brought up by three Marines, separately
        c.) The Mpod is small, flat, and easy to store
        d.) Touch screen very helpful especially the zooming
        e.) There is a lot you can do
        f.) There are a lot of apps that are good to have

b. "Would you be able to use the MPod in the field?" Four Marines responded no and seven Marines responded yes.
    1. The "no" responses included such comments as:
        a.) Always wearing gloves
        b.) Because of the ruggedness, it is not strong enough for what we do, durability issues
    2. The "yes" responses included such comments as:
        a.) Pubs and PME [content]
        b.) Could be used in the rear as well as in the field. Usefulness during in-theater situations.
        c.) Practical applications are easy to use. If there was an application that could help with network schemes, it would make my life much easier in the field.
        d.) To play simple instruction in audio in a different language. To communicate instruction in a foreign country
        e.) Primarily for the use of manuals and orders otherwise I don't see the significance
        f.) Depending on durability and the apps

### 2.2.4 Layout

The Marines analyzed the iPod touch layout, and a frequency count for each application was tabulated for both the top and bottom portions of the home screen. The number of applications that can be located on the bottom is limited to four, while the top portion can hold twelve applications. Based on the prototypes developed by the Marines, the highest frequency applications for the bottom were: FileAid, calendar, contacts, and notes. Based on frequency counts for each position, the order for applications is contacts, calendar, FileAid, and notes.

Regarding the top portion, all positions had more than two applications with equal frequency counts; however, across the positions there were specific places at which one application had the highest frequency count. Thus, the application configuration based on this process resulted in the following order, from the 1st to the 6th position: photos, clock, video, calculator, music, settings. Figure 9 illustrates the prototype configuration based on the Marines' feedback.

**Figure 9. iPod touch Prototype Configuration**

## 2.3   Focus Group Findings

Findings from several focus group sessions are described below. The findings are broken into three sections: Control and Display, Content, and CONOPS. Control and Display describes the feedback regarding the usability of the iPod touch. Content describes the information and applications that the Marines specified they would like to see on the device. CONOPS describes the operations that should be used to manage the system when the device is deployed.

### 2.3.1   Control and Display

When the Marines were asked about the iPod touch control and display, the greatest amount of feedback received regarded the controls. Overall, the Marines expressed concern about use when wearing gloves. Because the iPod touch is based on a capacitance rather than a pressure-based system, gloves cannot be worn. A large number of the Marines also found the keyboard difficult to use. Because of these frustrations, several of the Marines suggested that a stylus would be a useful alternative to gloves to minimize any difficulties in using the touch screen. They also recommended the stylus be integrated with or tethered in some way to the iPod touch, which is currently not an option.

In contrast to some of the concerns with the gloves and keyboard, the Marines provided only positive feedback regarding the manipulating and viewing of .pdf documents. The Marines stated that both viewing and manipulating (scrolling and zooming in or out) documents was easy to accomplish.

The Marines expressed mixed sentiments regarding the form factor of the iPod touch. A couple of concerns, such as the lack of ruggedization and size, were expressed. One of the Marines stated, "It's too small for me. I'd break it." It is important to note that the usability assessment was performed without protective cases.

The Marines held the iPod touch throughout the usability assessment. Only one Marine

expressed concern with the weight during the debriefing; he thought the device was heavy, and did not hold the device the entire duration but placed it on the table.

Battery life was stressed heavily by multiple Marines, who maintained they would prefer a battery life of no less than 4–6 hours. They discussed accessories that could be associated with extending battery life, e.g., solar charger, power converter, AA battery charger, USB port.

### 2.3.2  Content

This section is subdivided into two subsections. The first focuses on applications that the Marines requested. The second section focuses on content that could be added to the devices of specific interest to the Marines. Content can be any format, i.e., video, music, documents.

a. Applications: At the second LTA-only session, the Marines were asked to rank in order of priority the top five applications they wanted included in the MPod. Although the order and rankings between the two focus groups were not identical, many overlapped. Both groups ranked reference materials, such as technical manuals, as 1; translation software and language materials ranked 2; and maps were ranked 3 and 4. With other applications that did not overlap between the focus groups, entertainment ranked 3, cultural training ranked 4, and safety and/or survival ranked 5.

In addition, a variety of other applications were also noted by all the Marines. In no particular order, several requested a Physical Fitness Test (PFT) calculator, currency and unit converters, and a built-in Light-Emitting Diode (LED) flashlight. Other requests were for artillery and mortar calculators; latitude/longitude to/from grid (assume Military Grid Reference System [MGRS]) converter; basic first aid and survival information; environmental information i.e., in-theater plants and animals to avoid; dictionary and thesaurus; time, date, organizer, and calendar; level; compass; workout materials; radio frequency list; call signs; talk groups; on a secured MPod, communications security content; call for fire; and medical evacuation applications.

b. Materials: Marines identified several possible electronic materials.
1) User guides and quick-reference cards and a search function that would be beneficial with these publications
2) Publications from Web sites such as www.usmc.mil, MarineNet, Marine Online, Corpspedia, and on-line college courses.
3) External publications such as all orders, convoy briefs, standard operating procedures, technical and other manuals, and country handbooks
4) Topographic or commercial maps like Google's
5) Cultural classes and/or information specific to the area of deployment
6) Language training, like the Rosetta Stone software, or translators, like the Voxtech Phraselator, "… would have definitely helped over there."
7) Currently, deployed Marines receive a hard copy guide with a few key phrases and cultural taboos and permissions.
8) PME, although the Marines noted that PME isn't done in theater
9) Entertainment, such as a Morale, Welfare, and Recreation suite with movies, music, and games updated quarterly; or audiobooks

## 2.4 CONOPS

One of the first CONOPS items the Marines pointed out was the need for a centralized location, i.e., a Panasonic Toughbook, where all the content would be password protected and controlled by S6 (communications). Since most of the Marines were in communications, they suggested that S6 would be the logical place to house a central computer responsible for syncing, managing, troubleshooting, and issuing devices.

There was much discussion regarding whether Marines should be able to store personal content on MPods. While it is more complex to establish a personal profile for each Marine, it is possible to achieve, and deserves additional consideration. Some of the comments and questions that should be addressed are listed below:

a. Pros: Several individuals liked and/or suggested partitioning data into military and personal with limited space for personal data. The Marines would like space for personal pictures
b. Cons:
   1. Logistics are more complicated
   2. Increased workload for person in charge of maintaining devices
   3. Increased chance for misuse, i.e., blurs the line between being a tool for the job and an entertainment device

A few of the Marines also pointed out that having any entertainment content on a government-issued device, whether personal or government approved, may cause confusion about when and/or where viewing or listening to entertainment media is appropriate. Even if personal media were allowed, some Marines would continue to use their personal iPods or other devices for the increased storage space and greater control over content.

To evaluate the utility of a lightweight iPod touch during the EUE, one requirement is feedback and data gathering from users. The Marines revealed they would prefer paper surveys and background data logging to evaluate the device rather than pop-up surveys and questions that occur during routine use.

The Marines also recommended the MPod be evaluated by other potential users, e.g., motor transport personnel, combat and other engineers, and reconnaissance, artillery, logistics, and supply personnel.

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## 3.0 EUE IMPLICATIONS

Based on the findings of the usability assessment and the content and CONOPS input provided by the Marines, no significant challenges for EUE deployment are expected. Findings from the usability assessment indicate that the Marines were able to operate the iPod touch without substantial difficulties. This section summarizes the LTA findings and provides recommendations for the EUE.

### 3.1 Control and Display

Findings from the usability assessment indicate that the Marines performed well on the iPod touch even with limited training, supported using the device in the field, and recommended a home screen layout.

Accuracy and timing data demonstrated that the Marines quickly and effectively operated the iPod touch. The Marines performed almost all tasks on the first attempt and, on average, performed them, in less than 4 seconds. The only difficulty the Marines experienced when using the iPod touch was with the GUI slider bar task group, specifically the brightness task. In this task, it took the Marines approximately 2 times more attempts than average and 1.5 times longer. Although other slider bars were smaller than in the brightness tasks, the Marines did not have a similar problem operating them. Thus, it appears that the size of the slider bar does not influence performance, and it is recommended that Apple evaluate the brightness slider task further to identify the source of the issue. However, given the expected infrequent usage of the brightness task, this issue should not be of great concern.

The Marines' performance on the iPod touch was not impeded by hand or fingertip size. Results showed that neither hand nor fingertip size were correlated with performance (accuracy and time). The one exception is the significant correlation obtained between the index finger at 90-degrees and accuracy. Additional analysis suggests that this finding was influenced by a single outlier, and when that outlier is excluded, the result is no longer significant. Additional investigation, however, is still warranted because of the small sample size in this study.

Anthropometric measurements suggest a minimal fingertip size, regardless of the Marines' hand length or breadth. Findings from this study suggest that the minimal surface area of fingertips is essentially the same (less than $0.05$ cm$^2$) across the Marines; thus, another important result and recommendation is for a minimal button size of $0.05$ cm$^2$. This value is in contrast to present-day values that are obtained based on experimentation with various sizes of buttons. Furthermore, such a size recommendation goes beyond the current Apple recommendations that only refer to fingertip size but provide no quantitative values.

The Marines thought that the iPod touch was easy to use. Of five various iPod factors, all but one, the keyboard, received a score lower than average. In the two open-answer questions, a majority of the Marines provided positive statements regarding the iPod touch. Neither questionnaire responses nor focus group statements suggest difficulties with the iPod touch control and display.

The sole exception to these qualitative findings is that the Marines found the keyboard to be annoying and difficult to use. Some Marines stated that their "fat" fingers prevented them from easily performing keyboard tasks, although results from the usability assessment reveal no such problems. If Marines with "fat" fingers were hindered by the keyboard, then the time to type a note should increase with fingertip size. However, no such finding was obtained. The time to type a message using the keyboard was not correlated with either hand or fingertip size. Although the Marines did not respond as positively to the keyboard as they did other iPod touch features, this finding suggests that finger size did not influence the Marines' ability to operate the device. One potential method to mitigate the negative keyboard perspective is to provide additional keyboard training. The Marines in the LTA received limited training with the device (about 20 minutes), and no specific training regarding the use of the keyboard. Furthermore, no Marine had ever used an iPod touch before, although many had prior experience using PDAs. Thus, additional training and/or use of the device may change the perspectives about finger size and the ease of using the keyboard.

Finally, the Marines provided a prototype layout for the home screen display. Although they will have the ability to manipulate the display to fit their own personal preferences, this layout provides an initial baseline that can be used for the deployment of the EUE configuration.

## 3.2   CONOPS

Several different CONOPS items were examined in the focus group.

First, Marine units were identified for which the device would work best: combat and other engineers; and reconnaissance, artillery, logistics, motor transport, and supply personnel.

Second, regardless of where MPods are deployed, commanding officers should address several unresolved questions such as entertainment usage, personal usage and/or space, and wireless capability.

Third, although Marines were not specifically asked how they would like training to be provided, two different training sessions are recommended: one for the MPod users and one for MPod managers. Users should first receive in-house training to become familiar with the MPod. MPod users should also be provided with training videos that can be viewed on the MPods. When deployed, Marines would have access to these videos for refresher training.

MPod managers should receive separate training. Several Marines suggested that an S6 or data chief should oversee the MPod system and be given the necessary training required for operating and troubleshooting the system. Training for both MPod users and managers should take no longer than a day.

Fourth, evaluating the MPod during EUE feedback and data logging are necessary. The Marines said they would prefer to receive short hard copy surveys administered by senior personnel. Based on the concerns the Marines raised at the LTA, the following items will receive additional focus during the EUE.
   a.   Battery life

b. Ruggedization
c. Security for unclassified and/or classified documents
d. Distraction and/or personal use
e. Stylus and/or keyboard

The Marines also conveyed they would be willing to have usage data collected. This anonymous data would provide information about the type of applications used and the length of use.

Finally, the following equipment is recommended for EUE deployment. The Marines are provided at least one Panasonic Toughbook to manage the MPod system. Each MPod should be equipped with the following items:

a. iPod touch
b. Headphones
c. USB charger
d. Wall charger
e. Semi-rugged case
f. Pelican case to house the gear
g. Screen protector
h. AA battery charger

Additional accessories will allow the Marines to try out a variety of accessories and assess whether they would enhance MPod usage. However, these accessories are of limited supply and will not be available with each kit. S6 will manage and distribute these accessories: a stylus, additional protective cases, such as an OtterBox for iPod touch 2nd Generation Armor- or Defender-series case; a solar battery charger; a belt clip, and an armband.

## 3.3 Content

Numerous application recommendations were received. Given the limited time before the EUE, only a few applications are to be explored. These applications are based on the input and, in some cases, the ranking received from the Marines. Translation software and language content; maps; PFT calculator; currency and unit converter; built-in LED flashlight; artillery and mortar calculators; MGRS converter; basic first aid and survival information; environmental information; dictionary and thesaurus; time, date, organizer, and calendar; level; compass; workout materials; radio frequency list; call signs; and talk groups. To identify potential applications, the Apple iTunes application library will be searched. If multiple applications are identified, reviews of those applications will be conducted and, when necessary, in-house testing will be held to select a few different applications.

Finally, rather than spending time identifying generic content material, it is recommended that specific content be sought from the Marine unit that is selected for the EUE. Depending on where that unit is deployed, other content may be necessary.

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## APPENDIX A: PARTICIPANT TASK LIST

Limited Test Assessment data were collected through the Marines' completion of a predetermined set of tasks on the iPod touch as listed below.

1. Power ON
2. Adjust volume via hardware buttons
    a. Turn volume up
    b. Turn volume down
3. Adjust Settings
    a. Brightness (Note: auto brightness is on by default)
        1) Turn auto brightness off
        2) Turn brightness up
        3) Turn brightness down
    b. Set date and time
        1) 24-hour clock turn on
        2) Change the time zone
    c. Set passcode
4. Play video
    a. Open videos
    b. Select video x
    c. Adjust volume
        1) Turn up
        2) Turn down
    d. Resize window
        1) Wide screen
        2) Large screen
    e. Video position (small bar)
        1) Rewind video
        2) Fast forward video
    f. Video position (arrows)
        1) Rewind video
        2) Fast forward video
        3) Start video from beginning
    g. Video play
        1) Pause video
        2) Play video
    h. End video (done)
5. Play music
    a. Open music
    b. Select music x
    c. Change volume
        1) Turn up
        2) Turn down
    d. Music position (small bar)
        1) Rewind music

          2)  Fast forward music
     e.  Music position (arrows)
          1)  Rewind music
          2)  Fast forward music
          3)  Start music from beginning
     f.  Music play
          1)  Pause music
          2)  Play music
     g.  End music (done)

6. Notes
     a.  Typing messages–list of messages
     b.  Edit message–specific item

7. Document viewing
     a.  Open .pdf x
     b.  Go to page
     c.  Read sentences/view image object

8. Standby mode
     a.  Turn on
     b.  Turn off

9. Power OFF

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